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EXAMINER	
GRAHAM, ANDREW R	
ART UNIT	**PAPER NUMBER**
2644	

DATE MAILED: 03/24/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	09/826,503	CARTER, CHARLES H.	
	Examiner	Art Unit	
	Andrew Graham	2644	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *28 December 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1 and 3-8* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1 and 3-8* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 112

1. The amendment made to **Claim 5** in view of the previously applied rejection under 35 U.S.C. 112 -2nd paragraph, is sufficient to overcome the grounds of previous said rejection. Accordingly, the relevant rejections of **Claims 5 and 6** are hereby withdrawn.

Claim Objections

2. **Claim 5** is objected to because of the following informalities:

- as amended, Claim 5 states "tuning and internal microphone and internal speaker" in lines 1 and 2 of the amended claim. Based on the context of this phrase, it appears that "and internal microphone" should instead read "an internal microphone".

Appropriate correction or clarification is required.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson (USPN 5771297) in view of Powter et al (USPN 3912880).

Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies.

Regarding **Claim 8**, Richardson teaches:

A method of acoustic transducer calibration (function of filter 8, col. 3, lines 38-41) for optimizing the frequency response and gain of an internal speaker (17)(receives output of 8; col. 4, lines 23-25 and 50-53) located within a portable communication device (col. 2, lines 16-17; col. 3, lines 26-29) comprising the steps of:

generating a source ("training audio sequence") from at least one digital signal processor (50) located in the portable communications device (col. 3, lines 66-67; col. 4, lines 1-2);

providing the acoustic pseudo random noise to the internal speaker (12)(col. 4, lines 2-4);

directing the acoustic pseudo random noise from the internal speaker to a microphone in the portable communications device (col. 4, lines 9-10);

porting the output of the internal speaker to the at least one digital signal processor (col. 2, lines 10-11; Figure 3);

comparing (function of 15) the source with an output of the at least one digital signal processor (col. 2, lines 7-14; col. 4, lines 10-17); and

adjusting a plurality of coefficients in the at least one digital signal processor based upon differences in the source and the output of the at least one digital signal processor (col. 4, lines 12-20) to produce an optimized internal speaker output for the portable communications device (col. 4, lines 50-53).

However, Richardson does not clearly specify

- that the training audio sequence is an acoustic pseudo random noise

Powter discloses an acoustic measurement system that involves the generation of a pseudo random bit sequence that is converted to an audio signal.

Specifically regarding **Claim 8**, Powter teaches:

generating a source of acoustic pseudo random noise (col. 3, lines 11-31)

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to utilize a pseudo random sequence generated signal, such as generated in the system of Powter, for the training sequence associated with an embodiment of the system of Richardson. The motivation behind such a modification would have been that such a pseudo random sequence would have provided a single, stable training signal with plurality of represented frequencies for the frequency based comparison of the system of Richardson that avoids the necessity of repeated scans of the acoustic spectrum.

4. **Claim 5** is rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Powter as applied above, and in further view of Wong et al (USPN 5881103). Hereafter, "Wong et al" will be referred to as "Wong".

As detailed above, Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies. Powter discloses an acoustic measurement system that involves the generation of a pseudo random bit sequence that is converted to an audio signal.

Specifically regarding **Claim 5**, Richardson in view of Powter teaches:

A method of acoustic transducer calibration (function of filter 8, col. 3, lines 38-41 of Richardson) for tuning an internal microphone and internal speaker (17)(receives output of 8, based on frequency response of 13; col. 4, lines 23-25 and 50-53 of Richardson) in a portable two-way radio (col. 2, lines 16-17; col. 3, lines 26-29 of Richardson) without the use of test equipment comprising the steps of:

supplying a source of pseudo random noise from at least one digital signal processor (at least part of circuitry of 50)(col. 4, lines 2-4 of Richardson in view of col. 3, lines 11-31 of Powter);

directing the compensated pseudo random noise signal to a the internal microphone associated with the portable two-way radio (col. 4, lines 9-10);

filtering the output of the internal microphone to provide a compensated microphone signal (function of 14, Figure 3; col. 3, lines 7-10 and 34-36 of Richardson);

supplying the compensated microphone signal to the at least one digital signal processor (col. 3, lines 56-59 of Richardson);

comparing the output of the source of pseudo random noise (from 14) with an output of the at least one digital signal processor (col. 2, lines 10-14; col. 4, lines 9-12 of Richardson);

compensating a plurality of filter coefficients in the at least one digital signal processor (stored in 51) based upon differences in the source of the pseudo random noise and an output of the at least one digital signal processor (col. 4, lines 12-20 of Richardson); and

stopping the source of pseudo random noise (col. 4, lines 20-22 of Richardson); and

returning the portable two-way radio to an operational mode (col. 4, lines 22-23 of Richardson).

Richardson also notes that several transducers may be used with a device (col. 5, lines 5-9).

Richardson in view of Powter does not clearly specify:

- filtering the pseudo random noise to provide a compensated pseudo random noise signal;
- supplying the compensated pseudo random noise signal to a speaker external to the portable two-way radio;

Wong discloses a method and system for adjusting the signal processing of a portable communications devices which is connected to a plurality of auxiliary input and output signal devices.

Specifically regarding **Claim 5**, Wong teaches:

filtering the pseudo random noise ("sample signal") to provide a compensated pseudo random noise signal (application of sample signal to accessory, such as 130, the path of which comprises filter 454; col. 3, lines 62-66; col. 4, lines 31-39);

supplying the compensated pseudo random noise signal (output of 454) to a speaker external (451) to the portable two-way radio (110) (col. 3, lines 62-67; col. 4, lines 1-3).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to incorporate the accessory speaker of Wong as one of the transducers utilized in a portable communications device embodiment of the teachings of Richardson. The teachings of Richardson make an allowance for additional transducers, as is noted above. The motivation behind the use of such a particular additional accessory such as that taught by Wong, would have been the inclusion of an output device with a configuration or function not included in the communication device. The accessory disclosed by Wong would have also enabled such additional function or configuration to be adapted to the collective equalization parameters of the input and output devices used in the system.

5. **Claim 6** is rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Powter and Wong as applied above, and in further view of Eatwell et al (USPN 5481615). Hereafter, "Eatwell et al" will be referred to as "Eatwell".

As detailed above, Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies. Powter discloses an acoustic measurement system that involves the generation of a pseudo random bit sequence that is converted to an audio signal. Wong discloses a method and system for adjusting the signal processing of a portable communications devices which is connected to a plurality of auxiliary input and output signal devices.

While the system of Richardson discloses the comparison of an initially output signal and a received version of the same output signal, particular details regarding the timing of the involved, compared signals is not provided.

As such, Richardson in view of Powter and Wong do not clearly specify:

delaying (function of 4) the source of pseudo random noise compared with the output of the at least one digital signal processor (col. 3, lines 62-67; col. 4, lines 1-7, in view of the output of a test signal as particularly taught by Richardson).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to include at least a delay component

between the input of the amplifier (7) and the comparison circuit (15) of the system of Richardson in view of Powter and Wong. The motivation behind such a modification would have been that such a delay would have provided compensation for the non-ideal response of the test signal reception path and components of the system of Richardson in view of Powter and Wong.

6. **Claims 7, 1, 3, 4,** are rejected under 35 U.S.C. 103(a) as being unpatentable over Richardson in view of Powter and Wong as applied above, and in further view of Rapaich (USPN 4631749).

As detailed above, Richardson discloses a system for adjusting the parameters of an audio signal applied to a loudspeaker in a radio device in regards to various operation conditions, including loudspeaker deficiencies. Powter discloses an acoustic measurement system that involves the generation of a pseudo random bit sequence that is converted to an audio signal. Wong discloses a method and system for adjusting the signal processing of a portable communications devices which is connected to a plurality of auxiliary input and output signal devices.

Specifically regarding **Claim 7**, please refer above to the rejection of the similar limitations of Claims 5 and 8 regarding the "method", "generating", "providing", "directing", "porting", and "comparing".

Richardson particularly teaches:

adjusting a plurality of coefficients (stored in 51) in the at least one digital signal processor based upon differences in the acoustic pseudo random noise and the output of the at least one digital signal processor (col. 4, lines 12-20)

However, Richardson in view of Powter and Wong do not specify:

- that the adjusting of the coefficients produces an optimized microphone output for the portable communications device.

Rapaich teaches system for compensating an input microphone associated with frequency analysis components.

Specifically regarding **Claim 7**, Rapaich teaches:

adjusting a plurality of coefficients (stored in 52) in the at least one digital signal processor based upon differences in the acoustic pseudo random noise and the output of the at least one digital signal processor (col. 7, lines 39-68, in view of Richardson) to produce an optimized microphone output for the portable communications device (col. 5, lines 30-47).

To one of ordinary skill in the art at the time the invention was made, it would have been obvious to associate coefficients in the DSP in the system of Richardson in view of Powter and Wong with the filtering characteristics of the microphone input filter (14), as is suggested by the teachings of Rapaich. To one of ordinary skill in the art at the time the invention was made, it would have been obvious to make the characteristics associated with the input filter (14) of Richardson programmable in order to compensate for the non-linear

operating characteristics of the input microphone. Such compensation would have at least enabled the frequency analysis, if not the other processing associated with the microphone input, performed by the system of Richardson in view of Powter and Wong, to be performed according to detected frequency characteristics of a signal not degraded by the input components.

Regarding **Claim 1**, Richardson in view of Powter, Wong, and Rapaich teaches:

A method for acoustic transducer calibration in a portable communications device (function of filter 8, col. 3, lines 38-41; col. 2, lines 16-17; col. 3, lines 26-29 of Richardson) comprising the steps of:

providing a source of pseudo random acoustical noise (col. 4, lines 2-4 of Richardson in view of col. 3, lines 11-31 of Powter) to an characterized external speaker source separate from the portable communications device (application of sample signal; col. 4, lines 33-35 of Wong, in view of signal output of Richardson, col. 4, lines 2-4)

directing the pseudo random acoustical noise to an input of a an internal microphone used with the portable communications device (col. 4, lines 9-12 of Richardson),

adjusting first coefficients in at least one digital signal processor connected to the internal microphone for a desired microphone frequency response based upon the input of pseudo random acoustical noise (col. 7, lines 29-59 of Rapaich);

discontinuing the source of pseudo random acoustical noise from the external speaker source (col. 4, lines 2-23 of Richardson in view of col. 4, lines 37-41 of Wong),

applying the source of pseudo random acoustical noise to an internal speaker source in the portable communications device (col. 4, lines 2-4 of Richardson in view of col. 5, lines 1-8 of Richardson),

increasing the amplitude of the pseudo random acoustic noise such that it can be detected by the internal microphone (col. 2, lines 22-30);

adjusting second coefficients in the at least one digital signal processor for a desired internal speaker frequency response based upon the input of the pseudo random acoustical noise (col. 2, lines 25-33; col. 4, lines 12-20 and 40-43 of Richardson);

returning the portable communications device to an operational mode (col. 4, lines 23-25 of Richardson), and

utilizing a filter (454) between the source of pseudo random acoustical noise (generated by a DSP, such as in Richardson, col. 4, lines 2-4) and the external speaker (451) to compensate for irregularities in the frequency response of the external speaker (col. 3, lines 62-67; col. 4, lines 1-3 and 45-49 of Wong in view of the teaching that the comparison of values by 15 in Richardson is based on signals output by filter 8; col. 2, lines 61-66 and col. 3, lines 30-43, Figure 3).

Regarding **Claim 3**, Richardson particularly teaches:

comparing (function of 15) the output of the at least one digital signal processor (input to 7) with an optimal acoustic signal from the output of the pseudo random acoustic noise (received by 13) to provide an error signal (outputs of 30,31, Figure 3) for adjusting the coefficients (stored in 51) of the at least one digital signal processor (50)(col. 2, lines 18-21; col. 3, lines 30-43; col. 4, lines 9-20; Figures 3 and 4).

Regarding **Claim 4**, Richardson particularly teaches:

wherein the source of pseudo random noise is from the at least one digital signal processor (col. 4, lines 2-8).

Response to Arguments

7. Applicant's arguments with respect to claims 1 and 3-8 have been considered but are moot in view of the new ground(s) of rejection, as is further detailed above.

Conclusion

8. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Andrew Graham whose telephone number is 703-308-6729. The examiner can normally be reached on Monday-Friday, 8:30 AM to 5:00 PM (EST).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Sinh Tran can be reached on (703)305-4040. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SINH TRAN
SUPERVISORY PATENT EXAMINER

Andrew Graham
Examiner
A.U. 2644

ag
March 21, 2005